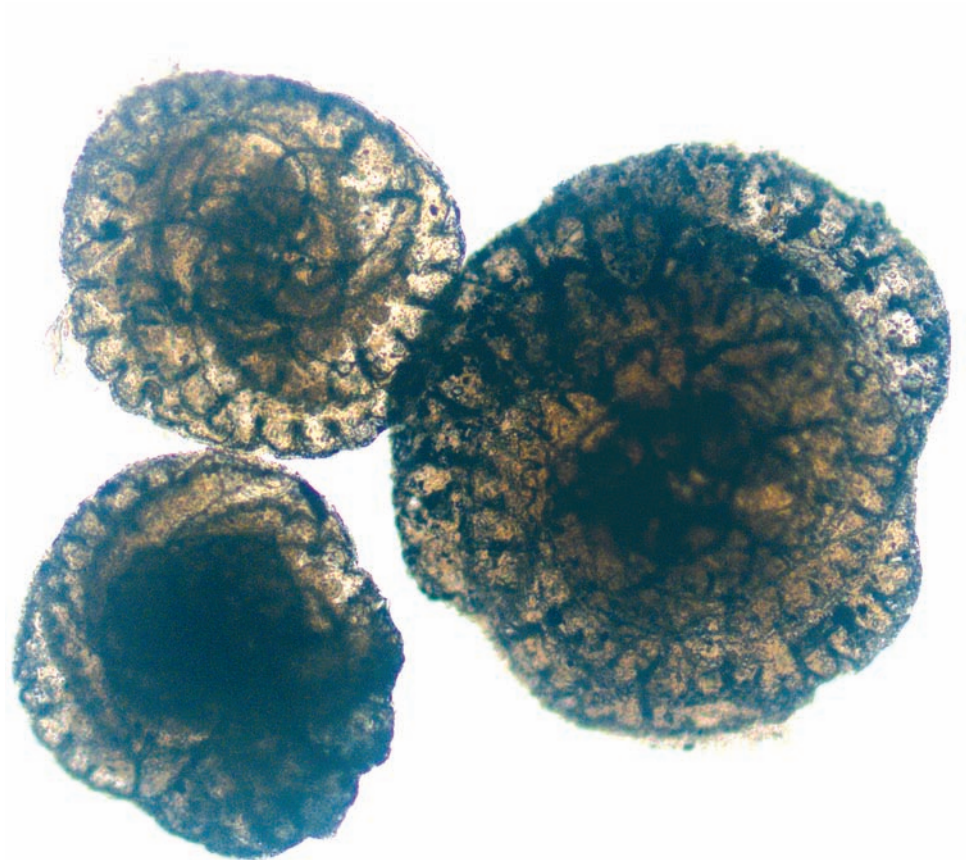


## Granuloreticulosa, Foraminifera

Members of the order Foraminifera are widely distributed in marine settings and can be found from polar regions to tropical latitudes and from shallow water environments to the abyssal plains of the deep sea. More than 300 benthic foraminiferal taxa have been reported from deep-sea hydrothermal vent regions, but most of them are not restricted to these environ-

ments. Some foraminiferal species that have been collected in vent regions also belong to planktonic species whose empty tests are accumulating on the sea floor. So far, only two endemic foraminiferal species have been described from vent regions, which are listed in the present work.



1: *Abyssotherma pacifica* from East Pacific Rise: 9°N, Riftia Field; by M. Bright.

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Granuloreticulosa, Foraminifera, Allogromida, Arboramminidae

*Luffammina atlantica* KAMENSKAYA, BAGIROV & SIMDIANOV, 2002

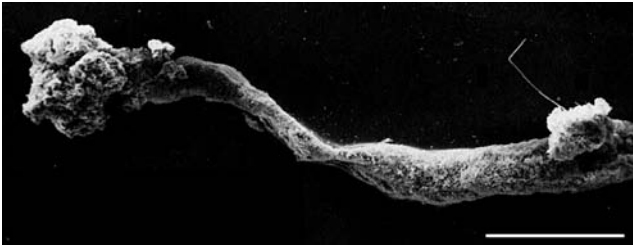
**Size:** Up to 2 cm in length.

**Morphology:** Agglutinated foraminifer with soft cylindrical tests are attached to the substrate by extended basal part. Upper extended part of the test may be dichotomously divided. Test wall consists of fine detritus and agglutinated coccolithes. Surface of the test is covered by a thick layer of *Methanotrix*-like bacteria. Inner volume of the test with fine agglutinated particles, diffuse cytoplasm and cavities. The genus *Luffammina* is

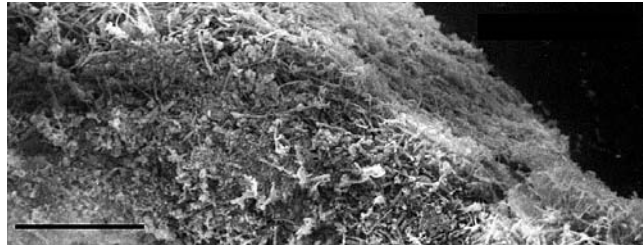
close to the genus *Arborammina* but differs from it by weak branching of the upper test, absence of bead-like structures on the test and absence of globogerins inside the test.

**Biology:** Found on the surface of relict hydrothermal chimneys.

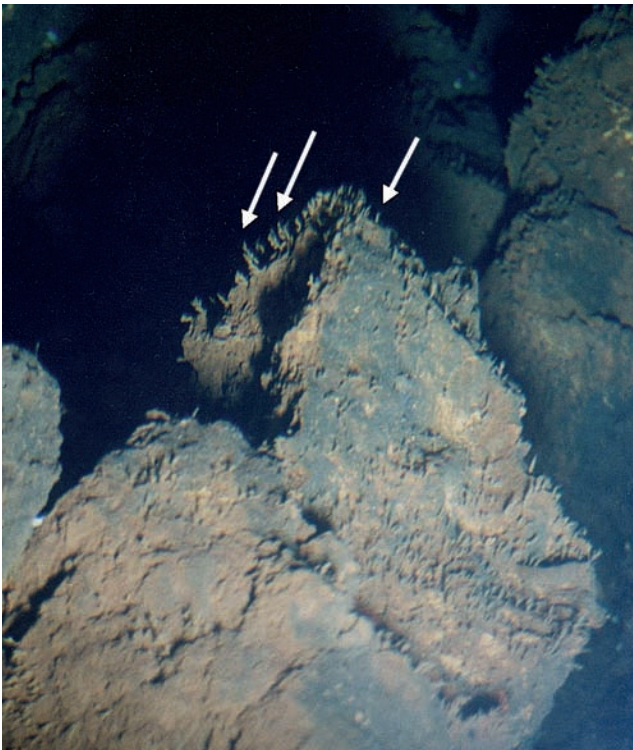
**Distribution:** Mid-Atlantic Ridge, site Rainbow.



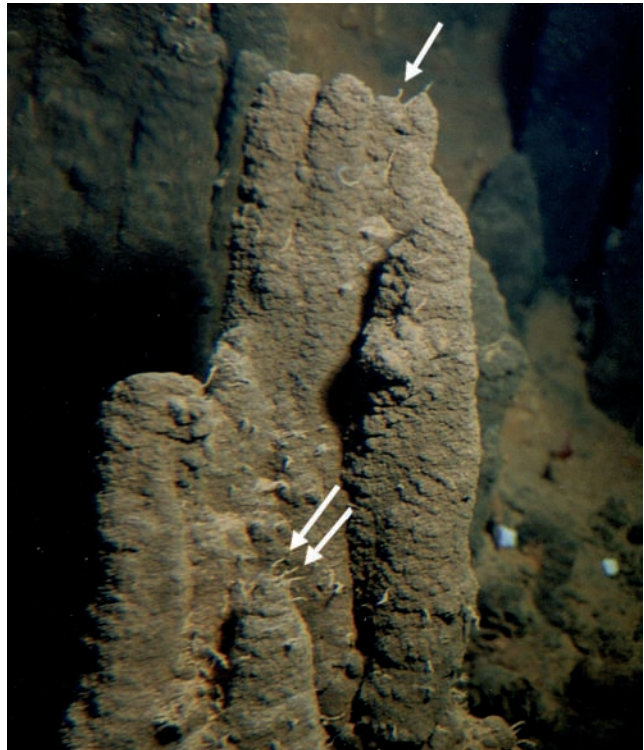
1: Test; scale bar 1 mm; by O. Kamenskaya.



2: Test surface covered with *Methanotrix*-like bacteria; scale bar 100 µm; by O. Kamenskaya.



3: Specimens (arrows) on hydrothermal chimneys; by O. Kamenskaya.



4: Specimens (arrows) on hydrothermal chimneys; by O. Kamenskaya.

**Reference:**

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Granuloreticulosa, Foraminifera, Textulariida, Remaneicidae

*Abyssotherma pacifica* BRÖNNIMANN, VAN DOVER & WHITTAKER, 1989

**Size:** Maximum and minimum test diameter, 940 and 830  $\mu\text{m}$ , respectively (holotype).

**Morphology:** Test free, a low watchglass-shaped trochospire. Adult chambers spirally elongate, umbilically asymmetric and mushroom-shaped; interior subdivided by secondary septa formed by infolding of inner organic sheet. Aperture double: primary opening interiomarginal, in strongly incurved anterior flank of septum, anteriorly directed; secondary opening in axial-sutural position at tip of posterior flank of septum, posteriorly directed, also interiomarginal. Wall imperforate, consisting of agglutinated layer between outer and inner organic sheets.

**Biology:** According to BRÖNNIMANN et al. (1989), *A. pacifica* occurs in artificial recruitment arrays placed in the vicinity of deep-sea (2600 m) hydrothermal springs in the East Pacific. Water temperature immediately surrounding the arrays was near ambient. *Abyssotherma pacifica* occurs also associated with *Riftia pachyptila* and on bare basalt, suggesting a wide range of temperature and sulfide tolerance (pers. comm. Bright).

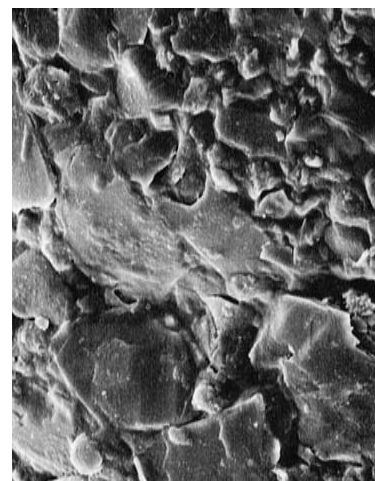
**Distribution:** East Pacific Rise: 21°N (BRÖNNIMANN et al. 1989) and 9°N (pers. comm. Bright).



1: Umbilical view x 80  
© Micropaleontology.



2: Spiral view x 80  
© Micropaleontology.



3: Close-up of agglutinated test, spiral view x 125 © Micropaleontology.

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Autor(en)/Author(s): Holzmann Maria

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